

Digital **Videocassette** **Recorder**

Instructions for Use page 1^{GB}**GB**

Before operating the unit, please read this manual thoroughly and retain it for future reference.

Mode d'emploi page 1^{FR}**FR**

Avant la mise en service de cet appareil, prière de lire attentivement ce mode d'emploi que l'on conservera pour toute référence ultérieure.



DSR-20MDP only
DSR-20MDP seulement



DSR-20MD/20MDP

Owner's record

The model number is located at the side and front of the unit and the serial number on the side. Record the model number and serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Symbol on the products



This symbol indicates the equipotential terminal which brings the various parts of a system to the same potential.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Note:

Model DSR-20MD has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. Model DSR-20MDP has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and EN60601-1-2, CISPR 11, Class A. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

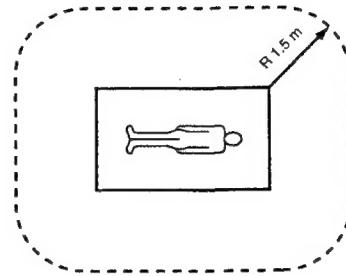
For the customers in Canada (for DSR-20MD)

This unit has been certified according to Standard CSA C22.2 No.601.1.

Important safeguards/notices for use in the medical environments

1. All the equipments connected to this unit shall be certified according to Standard IEC60601-1, IEC60950, IEC60065 or other IEC/ISO Standards applicable to the equipments.
2. When this unit is used together with other equipment in the patient area*, the equipment shall be either powered by an isolation transformer or connected via an additional protective earth terminal to system ground unless it is certified according to Standard IEC60601-1.

* Patient Area



3. The leakage current could increase when connected to other equipment.
4. This equipment generates, uses, and can radiate frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause interference to other equipment. If this unit causes interference (which can be determined by unplugging the power cord from the unit), try these measures: Relocate the unit with respect to the susceptible equipment. Plug this unit and the susceptible equipment into different branch circuit. Consult your dealer.

Caution on DC power sources

When you operate the unit using DC power sources, be sure to establish a ground for this unit using the equipotential ground terminal \downarrow .

For an earth cable to be used, consult your Sony dealer.

Disposal

When you dispose the unit or accessories, you must obey the law in the relative area or country and the regulation in the relative hospital.

For the customers in the Netherlands Voor de Klanten in Nederland



Bij dit product zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

Precautions

Safety

- Operate DSR-20MD only on 120 V AC, 60 Hz.
- Operate DSR-20MDP only on 220 – 240 V AC, 50 Hz. Check that the unit's operating voltage is identical with your local power supply.
- If anything falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- The unit is not disconnected from the mains as long as it is connected to the mains outlet, even if the unit itself has been turned off.
- Unplug the unit from the wall outlet if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord.
- The DC input is to be supplied by Sony Ni-Cd Rechargeable Battery Pack BP-90A with battery adaptor and cable. The battery pack is to be recharged by Sony Battery Charger BC-410*. To comply with UL2601-1 and IEC60601-1, the battery charger must be located outside the patient area as described on page ii.

*: BC-410 for DSR-20MD

BC-410CE for DSR-20MDP

Installing

- Allow adequate air circulation to prevent internal heat buildup.
- This unit is equipped with a fan at the rear. Do not insert objects nor touch the fan during operation.
- To prevent internal heat buildup, install the unit at least 5 cm away from the wall, and dust the unit periodically.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- The unit is not designed for portable use. Install it properly on a flat stable place. Placing it on its side or on a surface slanted more than 30 degrees may cause damage.
- Keep the unit and cassettes away from equipment with

strong magnets, such as microwave ovens or large loudspeakers.

- Do not place heavy objects on the unit.
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the VCR and cause damage to the video head and tape. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

Information

Compatible color systems

The DSR-20MD is designed to record and play back using the NTSC color system. Recording of video sources based on other color systems cannot be guaranteed.

Compatible colour systems

The DSR-20MDP is designed to record and play back using the PAL colour system. Recording of video sources based on other colour systems cannot be guaranteed.

Caution

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmission and/or program owner.

Precautions

Safety

- Operate DSR-20MD only on 120 V AC, 60 Hz.
- Operate DSR-20MDP only on 220 – 240 V AC, 50 Hz. Check that the unit's operating voltage is identical with your local power supply.
- If anything falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- The unit is not disconnected from the mains as long as it is connected to the mains outlet, even if the unit itself has been turned off.
- Unplug the unit from the wall outlet if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord.
- The DC input is to be supplied by Sony Ni-Cd Rechargeable Battery Pack BP-90A with battery adaptor and cable. The battery pack is to be recharged by Sony Battery Charger BC-410*. To comply with UL2601-1 and IEC60601-1, the battery charger must be located outside the patient area as described on page ii.

*: BC-410 for DSR-20MD
BC-410CE for DSR-20MDP

Installing

- Allow adequate air circulation to prevent internal heat buildup.
- This unit is equipped with a fan at the rear. Do not insert objects nor touch the fan during operation.
- To prevent internal heat buildup, install the unit at least 5 cm away from the wall, and dust the unit periodically.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- The unit is not designed for portable use. Install it properly on a flat stable place. Placing it on its side or on a surface slanted more than 30 degrees may cause damage.
- Keep the unit and cassettes away from equipment with

strong magnets, such as microwave ovens or large loudspeakers.

- Do not place heavy objects on the unit.
- If the unit is brought directly from a cold to a warm location, moisture may condense inside the VCR and cause damage to the video head and tape. When you first install the unit, or when you move it from a cold to a warm location, wait for about one hour before operating the unit.

Information

Compatible color systems

The DSR-20MD is designed to record and play back using the NTSC color system. Recording of video sources based on other color systems cannot be guaranteed.

Compatible colour systems

The DSR-20MDP is designed to record and play back using the PAL colour system. Recording of video sources based on other colour systems cannot be guaranteed.

Caution

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmission and/or program owner.

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Features

The DSR-20MD/20MDP is a 1/4-inch digital video cassette recorder that uses the DVCAM digital recording format. This system achieves stable, superb picture quality by digitally processing video signals that are separated into color difference signals and luminance signals (component video).

The unit is equipped with a full-fledged analog interface to support hybrid systems that combine conventional analog equipment with digital equipment.

The DSR-20MD/20MDP's main features are described below.

DVCAM Format

DVCAM is based on the consumer DV format, which uses the 4:1:1 component digital format (DSR-20MD) or the 4:2:0 format (DSR-20MDP), and provides a 1/4-inch digital recording format for professional use.

High picture quality, high stability

Video signals are separated into color difference signals and luminance signals, which are encoded and compressed to one-fifth size before being recorded to ensure stable and superb picture quality.

Because the recording is digital, multi-generation dubbing can be performed with virtually no deterioration of quality.

Wide track pitch

The recording track pitch is 15 μ m, fully 50 percent wider than the DV format's 10 μ m track pitch. Thanks to this feature, the DVCAM format sufficiently meets the reliability and precision requirements of professional editing.

High-quality PCM digital audio

PCM recording makes for a wide dynamic range and a high signal-to-noise ratio, thereby enhancing sound quality.

There are two recording modes: 2-channel mode (48 kHz sampling and 16-bit linear code), which offers sound quality equivalent to the DAT (Digital Audio Tape) format, or 4-channel mode (32 kHz sampling and 12-bit nonlinear code).

Playback compatibility with DV format

A DV cassette recorded on a DV-format VCR can be played back on this unit. (Cassettes recorded in LP mode cannot be played back.)

Choice of two cassette sizes

The unit can use both standard-size and mini-size DVCAM cassettes.

- According to cassette size, it automatically changes the position of the reel drive plate.
- The maximum recording/playback times are 184 minutes for standard size cassettes and 40 minutes for mini-size cassettes.

Other Features

Compact size

The unit achieves compact size suitable for using on a demonstration. The unit is also equipped with basic functions that are needed for videocassette recorders and players used in professional digital video editing systems.

— DC IN connector

The unit is equipped with the — DC IN connector to use in the case that the AC power is not available. Connect the optional BP-90A Ni-Cd Battery Pack with the battery adaptor and DC cable

Menu system for functionality and operation settings

The unit provides a menu system to make its various functions easier to use and set up its operation conditions.

Superimposition function

Time code, menus, error messages, and other text data can be superimposed and output in analog composite video signals.

Remote control

The unit can be operated by remote control from an editing controller that supports the RS-232C interface or from a SIRCS¹⁾-system remote controller or foot switch such as the optional DSRM-10 or SVRM-100A.

1) SIRCS

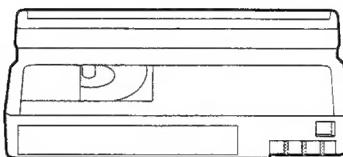
SIRCS-system has the same function as CONTROL S-system.

Notes on Video Cassettes

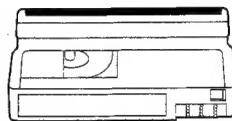
Usable cassettes

Use Standard-DVCAM cassettes or Mini-DVCAM cassettes with this VCR. PDV-184ME can record programs for 184 minutes and PDVM-40ME can record for 40 minutes.

You can get the highest quality pictures with this digital video cassette recorder using DVCAM cassettes. You may not be able to get as good quality with other cassettes. We recommend using DVCAM cassettes so that you can record your one-time events in highest quality.



DVCAM cassette



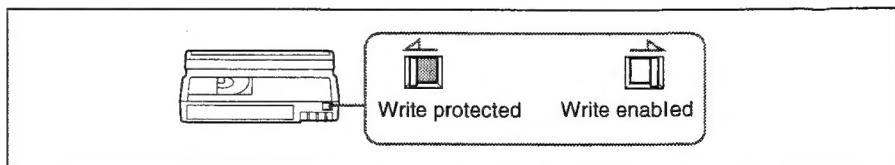
Mini DVCAM cassette

Cassette memory

Cassette memory is an optional feature that is mounted on some Standard DVCAM cassettes and Mini DVCAM cassettes. When you record a program, the recording date and time, and the program's position on the tape are stored in the cassette memory so that you can quickly locate the program later on. **CII16K** indicates that you can use the cassettes 16 kbits of data can be stored on. On this VCR, you can use the cassettes up to 16 kbits of data can be mounted on.

To save a recording

To prevent accidental erasure of a recording, slide in the safety switch on the cassette so that the red portion becomes visible. To record on a tape, slide out the switch so that the red portion is hidden.

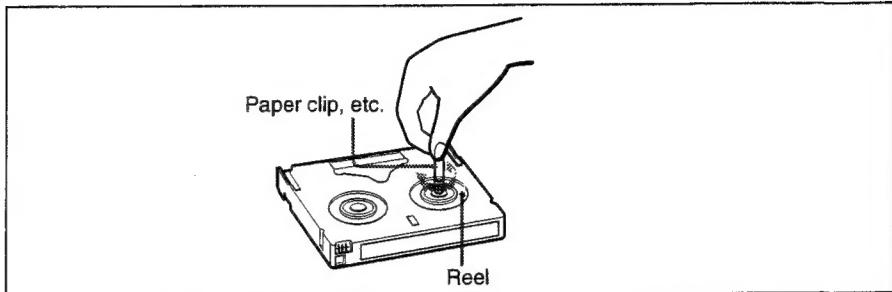


Note

DVCAM, **DV**, **MiniDV** and **CII** are trademarks.

Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack. Insert the cassette into the cassette compartment, and after about 10 seconds take it out.



Notes on Recording / Playback

Copyright precautions

On recording

You cannot record any software having copyright protection signals on this VCR. If you start recording protected video and audio signals, a warning message appears on the monitor screen and the VCR stops recording.

On playback

When you play back software having copyright protection signals on this VCR, you may not be able to copy it onto other equipment.

Limitations caused by the difference in format

This VCR can record, play back and edit the tapes recorded in DVCAM format. It can also play back the tapes recorded in DV format (SP mode). However, due to the difference in format, you may not be able to record or edit some tapes affected by recording conditions of the tape (e.g., A tape originally recorded in DV format is dubbed in DVCAM format). For details, refer to "Compatibility of DVCAM and DV format" on page 42.

No compensation for contents of the recording

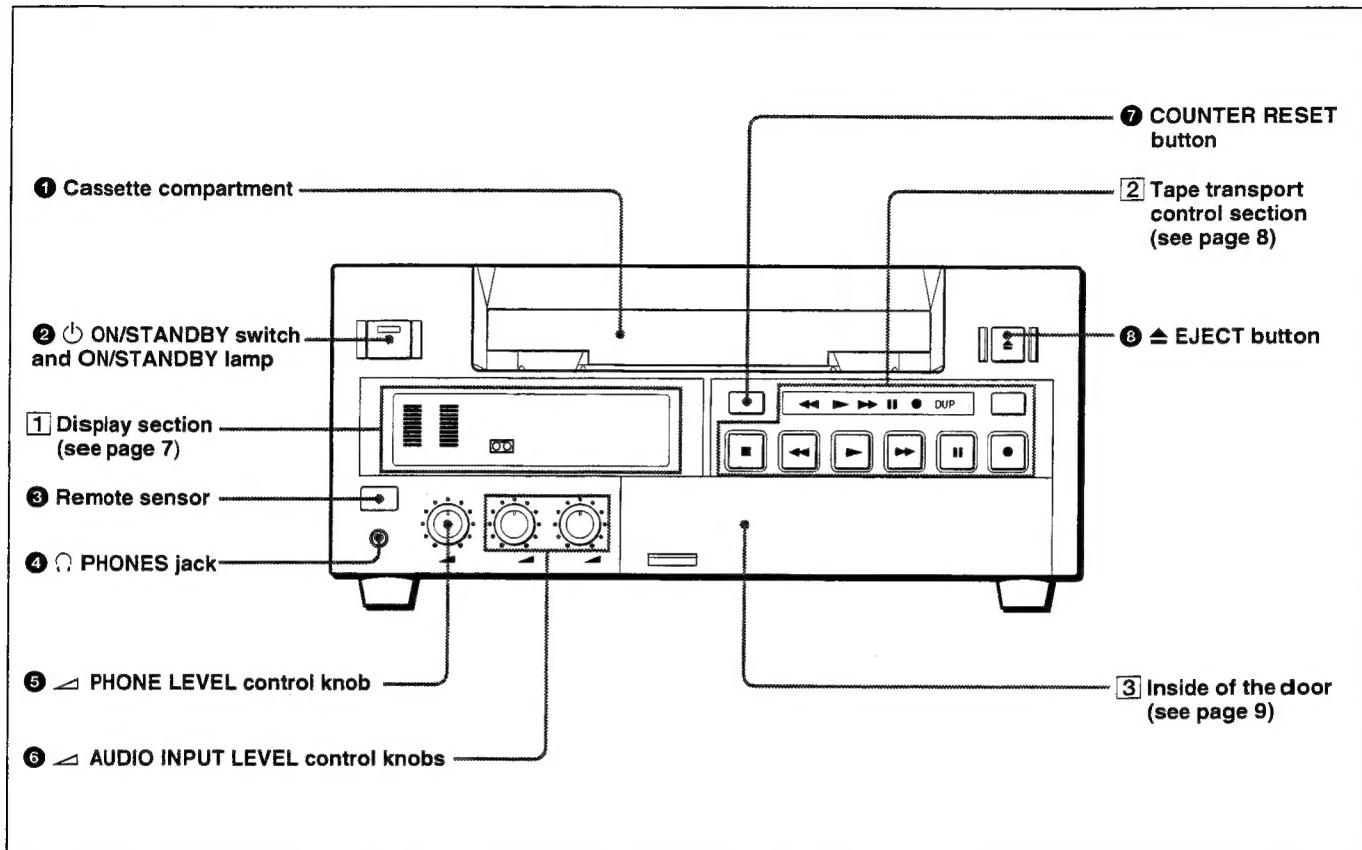
Contents of the recording cannot be compensated for if recording or playback is not made due to a malfunction of the VCR, video tape, etc.

Note

You cannot play back a DVCAM tape recorded in other color system on this VCR.

Location and Function of Parts

Front Panel



① Cassette compartment

Accepts standard-size or mini-size DVCAM digital videocassettes. When using a mini-size cassette, insert it into the middle of the compartment.

For details of usable cassettes, see page 4.

② ⏪ ON/STANDBY switch and ON/STANDBY lamp

Press this switch to turn on the power, and the ON/STANDBY lamp lights in green. Press it again to turn to standby mode, and the lamp goes off.

Note

When the REMOTE/LOCAL switch is set to REMOTE, you cannot turn the unit to standby mode.

③ Remote sensor

④ Ⓜ PHONES jack (stereo minijack)

Connect stereo headphones for headphone monitoring during recording or playback.

The audio signal you want to monitor can be selected

with the AUDIO MONITOR selector inside of the door (③).

⑤ ▲ PHONE LEVEL control knob

Controls the volume of the headphones connected to the Ⓜ PHONES jack.

⑥ ▲ AUDIO INPUT LEVEL control knobs

When recording, you can use these knobs to set audio input levels for CH-1 (channel 1) and CH-2, respectively.

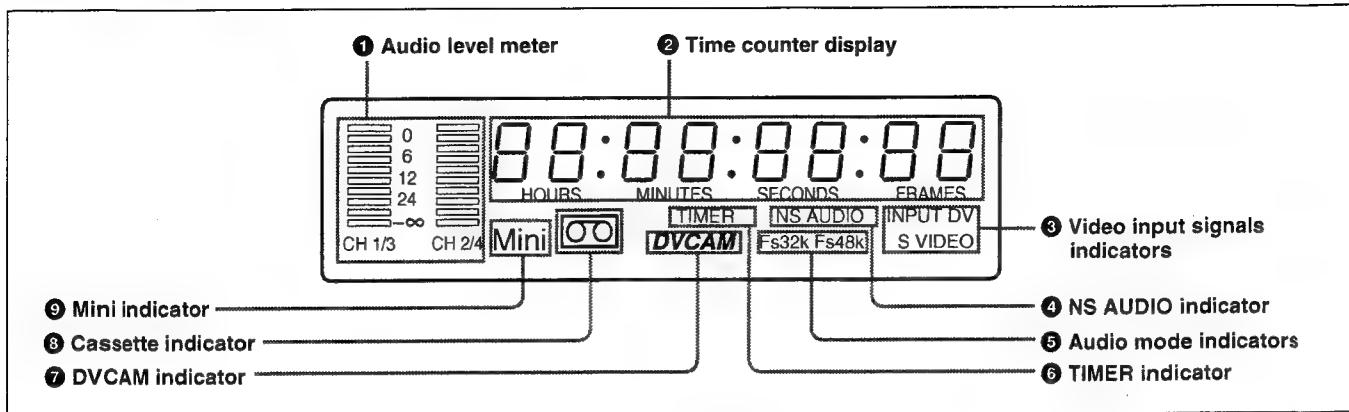
⑦ COUNTER RESET button

Press this button to reset the tape counter in the display window to “0:00:00 (0H00M00S).” This button does not work when displaying the time code or the remaining time.

⑧ ▲ EJECT button

Press this button to eject a cassette.

1 Display section



① Audio level meter

Indicates the recording level during recording or EE mode¹⁾ and the playback level during playback. When the audio level exceeds 0 dB, the red indicator lights.

Note

If you play back the tape whose audio was only recorded on channel 2, the audio level meter for CH2/4 may not function.

② Time counter display

Indicates the following:

- Time data: count value of the time counter, time code and remaining time
- Alarm messages (see page 35)
- Messages for self-diagnosis function (see page 39)

Notes

- For DSR-20MDP: Time code is set to the non drop frame mode only.
- Time code is indicated as follows:
 - Drop frame: "00:00.00:00" ("00:00,00:00" on the monitor) (DSR-20MD only)
 - Non drop frame: "00:00:00:00"

③ Video input signals indicators

Indicates the currently selected video input signals. INPUT VIDEO, INPUT S VIDEO or INPUT DV lights.

④ NS (Non Standard) AUDIO indicator

Lights when the VCR plays back a tape whose audio recording was made in the unlock mode, or when unlock mode signals are input through the DV jack.

For details of unlock mode, see page 42.

⑤ Audio mode indicators

Indicates the audio mode during playback or recording, or while in EE mode.

- During playback it indicates the audio mode in which the tape was recorded.
- During recording or while in EE mode, it indicates the currently selected audio recording mode. You can select audio recording mode by setting "AUDIO MODE" menu (see page 33).

Fs32k: Lights when playing the tapes recorded in 4-channel mode, or recording a tape in 4-channel mode.

Fs48k: Lights when playing the tapes recorded in 2-channel mode, or recording a tape in 2-channel mode.

Note

When recording in 4-channel mode on this VCR, audio signals are recorded only in channels 1/2.

⑥ TIMER indicator

Lights when setting the TIMER switch to REPEAT or REC.

⑦ DVCAM indicator

Lights except playing back the DV-formatted tapes.

1) EE mode

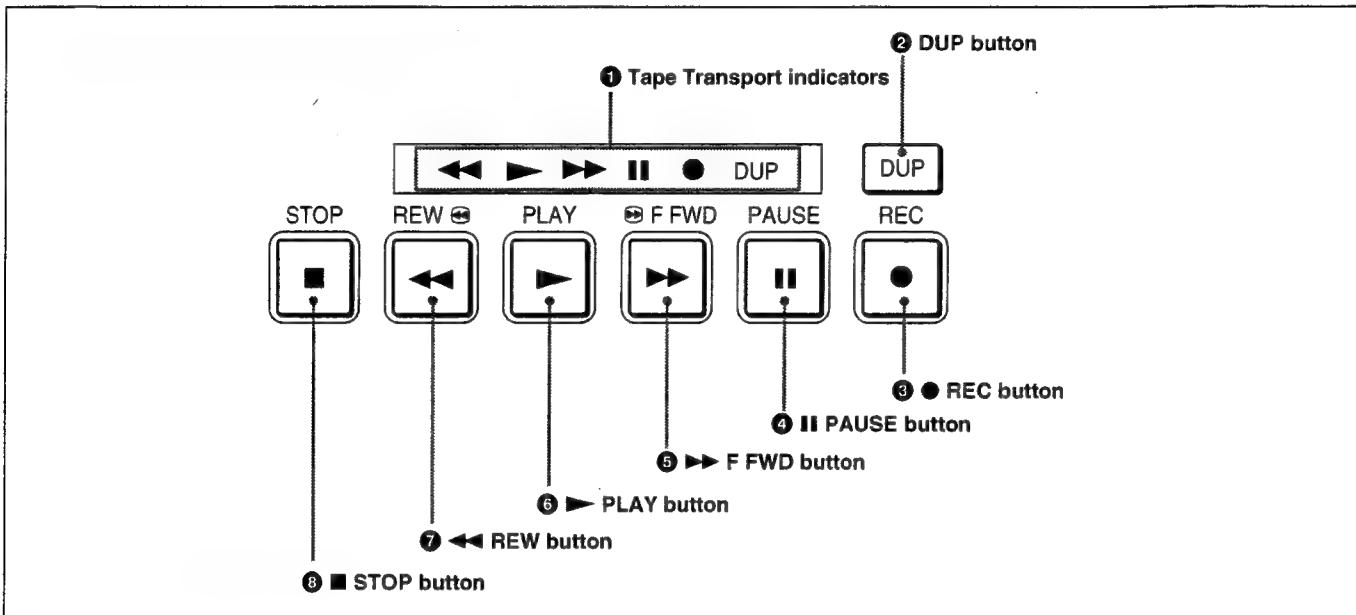
"EE" stands for "Electric to Electric". When in this mode, the video and audio signals that are input to the VCR's recording circuitry do not pass through any magnetic conversion circuits but instead are output via electric circuits only. This mode is used to check input signals and adjust input levels.

Location and Function of Parts

⑧ Cassette indicator

Lights when inserting a digital video cassette available for this VCR. It flashes when ejecting a cassette.

② Tape transport control section



① Tape Transport indicators

② DUP (duplicate) button

Use this button to make a work tape having the same time code as the source tape.

For details of duplicate, see page 30.

③ ● REC (record) button

When you press the ▶ PLAY button while holding down this button, the indicator lights and recording begins. To set the VCR to recording pause mode, press the ■■ PAUSE button while holding down this button.

④ ■■ PAUSE button

When you press this button, the indicator lights and the VCR is set to pause mode.

⑤ ▶▶ F FWD (fast forward) button

When you press this button, the indicator lights and the tape is fast forwarded. During fast forward, the picture does not appear on the monitor (you can see the picture of the EE mode during fast forward).

To search forward, hold this button down during fast forward.

⑨ Mini indicator

Lights when inserting mini-size digital video cassette.

⑥ ▶ PLAY button

When you press this button, the indicator lights and playback begins.

If you press this button while holding down the ▶◀ REW button during stop, the tape is rewound to its beginning and starts playing automatically (during rewind, the REW indicator lights and the PLAY indicator flashes).

⑦ ▶◀ REW (rewind) button

When you press this button, the indicator lights and the tape starts rewinding. During rewind, the picture does not appear on the monitor (you can see the picture of the EE mode during rewind).

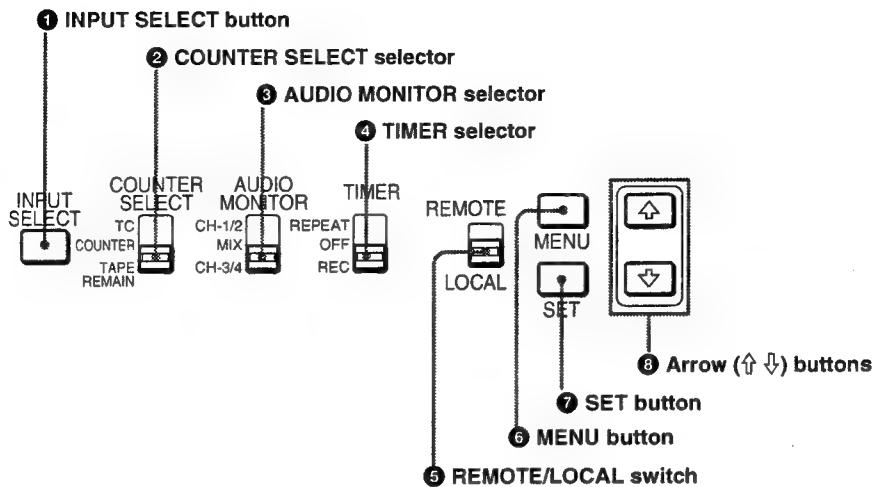
To search backward, hold this button down during rewind.

If you press the ▶ PLAY button while holding down this button during stop, the tape is rewound to its beginning and starts playing automatically (during rewind, the REW indicator lights and the PLAY indicator flashes).

⑧ ■■ STOP button

Press this button to stop the current tape transport operation.

3 Inside of the door



1 INPUT SELECT button

Select video input signals. Each press of this button cycles through three video signal selection options: video, S-video, and DV input. When you select one of these options, the corresponding indicator in the display lights up.

2 COUNTER SELECT selector

Select the type of time data in the time counter display.

TC: Time code

COUNTER: Count value of the time counter

TAPE REMAIN: Remaining time

3 AUDIO MONITOR selector

Use to select the audio track you want to hear when playing back a tape recorded in 4-channel mode (Fs32k).

CH-1/2: Channels 1/2 only

MIX: Channels 1/2 and channels 3/4 (mix)

CH-3/4: Channels 3/4 only

4 TIMER selector

Use to select timer recording or auto repeat using an external AC timer (not supplied).

REPEAT: When the power is supplied to this VCR, a tape rewinds to its beginning automatically and playback starts. The VCR repeats the playback from the beginning to the first index (if there is no index on the tape, to the unrecorded portion; if no unrecorded portion, to the tape end). Auto repeat also functions if you set this selector to REPEAT during playback.

OFF: Timer is released.

REC: When the power is supplied to this VCR, recording starts.

5 REMOTE/LOCAL switch

Selects whether the unit is operated from its front panel or from external (remote) equipment.

REMOTE : The unit is operated from an editing controller connected to the RS-232C  connector on the rear panel. No operation on the front panel works except sliding the switch or selectors.

LOCAL : The unit is operated from its front panel, from an external equipment connected to the LANC  jack on the rear panel, or from a SIRCS-system remote controller connected to the REMOTE  CONTROL S jack on the rear panel.

6 MENU button

Press this button to display the menu on the monitor screen. Press it again to return from the menu display to the usual display.

Note

If you set the REMOTE/LOCAL switch to REMOTE while the menu display is on the monitor, it returns to the usual display.

On how to use the menu, see Chapter 3 "Menu Settings."

7 SET button

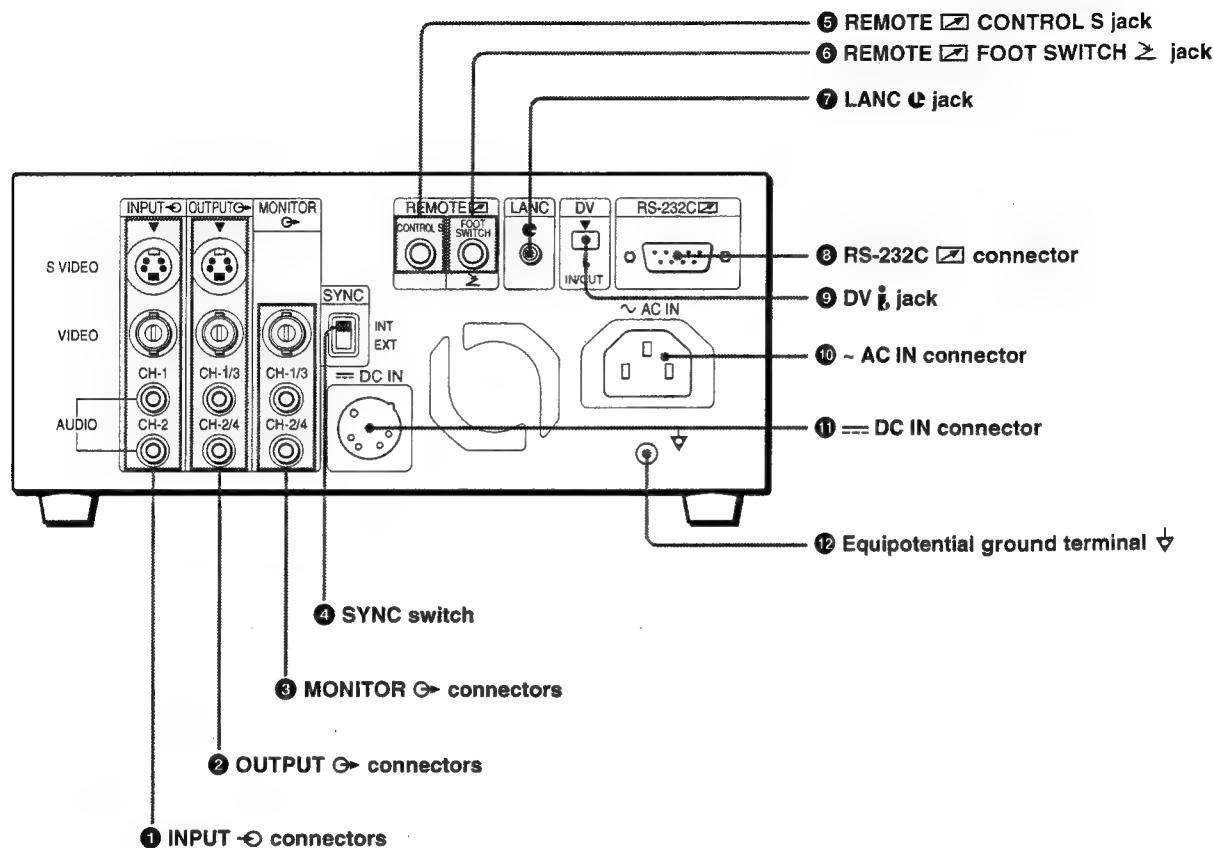
Press this button to save selected menu items to the unit's memory.

8 Arrow (↑ ↓) buttons

Use these buttons to move around the menu items.

Location and Function of Parts

Rear Panel



1 INPUT -> connectors

Input video and audio signals. To connect a VCR equipped with the S-video output jack, use the S VIDEO jack on this VCR.

2 OUTPUT -> connectors

Output video and audio signals. To connect a VCR equipped with the S-video input jack, use the S VIDEO jack on this VCR.

3 MONITOR -> connectors

Output video and audio signals for monitoring.

4 SYNC switch

Selects the reference signal. The video signal is locked to V-sync or H-sync, but not locked to sub-carrier. The sync phase is not adjusted. The video signal is not locked to DV input.

INT: Selects the playback signal on this VCR as the reference signal.

EXT: Selects the input video signal from the external equipment connected to this VCR as the reference signal.

Notes

- The picture and the sound may be distorted if:
 - You set the SYNC switch during playback.
 - The analog signal is input from the INPUT -> connectors during playback with the SYNC switch set to EXT.
- If the SYNC switch is set to EXT during playback, the INPUT SELECT button does not work.

5 REMOTE  CONTROL S jack

Connect a SIRCS-system remote controller. When controlling this VCR from a remote controller such as the DSRM-10 or SVRM-100A (not supplied), connect the unit to the editing controller via this jack.

Note

SIRCS-system has the same function as CONTROL S-system.

6 REMOTE  FOOT SWITCH  jack

Connect the optional Foot Switch to control this VCR.

Note

The Foot Switch must be conformed with Standard UL2601-1/EN60601-1.

For details on the Foot Switch, consult with authorized Sony dealers.

7 LANC  jack

When you connect the LANC  jacks on this VCR and the other VCR, you can control this VCR (player) from the other VCR. The LANC connection transmits signals such as control signals, time code and time counter data and status data.

You can control this VCR by connecting the optional RM-95 Remote Commander to this jack.

Notes

- The other VCR (recorder) receives the time code data from the LANC  jack only when this VCR (player) is set to show the time code indications.
- If the REMOTE/LOCAL switch is set to REMOTE, the LANC connection does not transmit signals.

8 RS-232C  connector (D-sub 9-pin)

Connect an editing controller or a personal computer with the RS-232C interface for remote-control of this VCR.

9 DV  jack

The DV  jack is i.LINK compatible. Use when the equipment connected to the VCR has a DV  jack. If you connect the VCR and the other equipment using DV  jacks, you can minimize deterioration of picture quality during dubbing, editing or capturing still pictures into a personal computer by digital processing. For details, refer to the instruction manual of the equipment you use.

Note

 is a trademark of Sony Corporation and indicates that this product is in agreement with IEEE1394-1995 specifications and their revisions.

10 ~ AC IN connector

Connect to an AC power outlet using the supplied power cord.

11 == DC IN connector

Connect the optional BP-90A Ni-Cd Battery Pack with the battery adaptor and DC cable.

Notes

- If the voltage of the Battery Pack falls less than 11 V, a beep sound is output (when BEEP in the menu is set to OFF, it is not output) and "dclo" appears in the display window. Replace the battery by a charged one or remove it to use the AC power outlet.
- If the voltage of the Battery Pack falls less than 10.5 V, a beep sound is output (when BEEP in the menu is set to OFF, it is not output) and the VCR is set to the standby mode. As you cannot turn on the VCR at this moment, replace the battery by a charged one or remove it to use the AC power outlet.

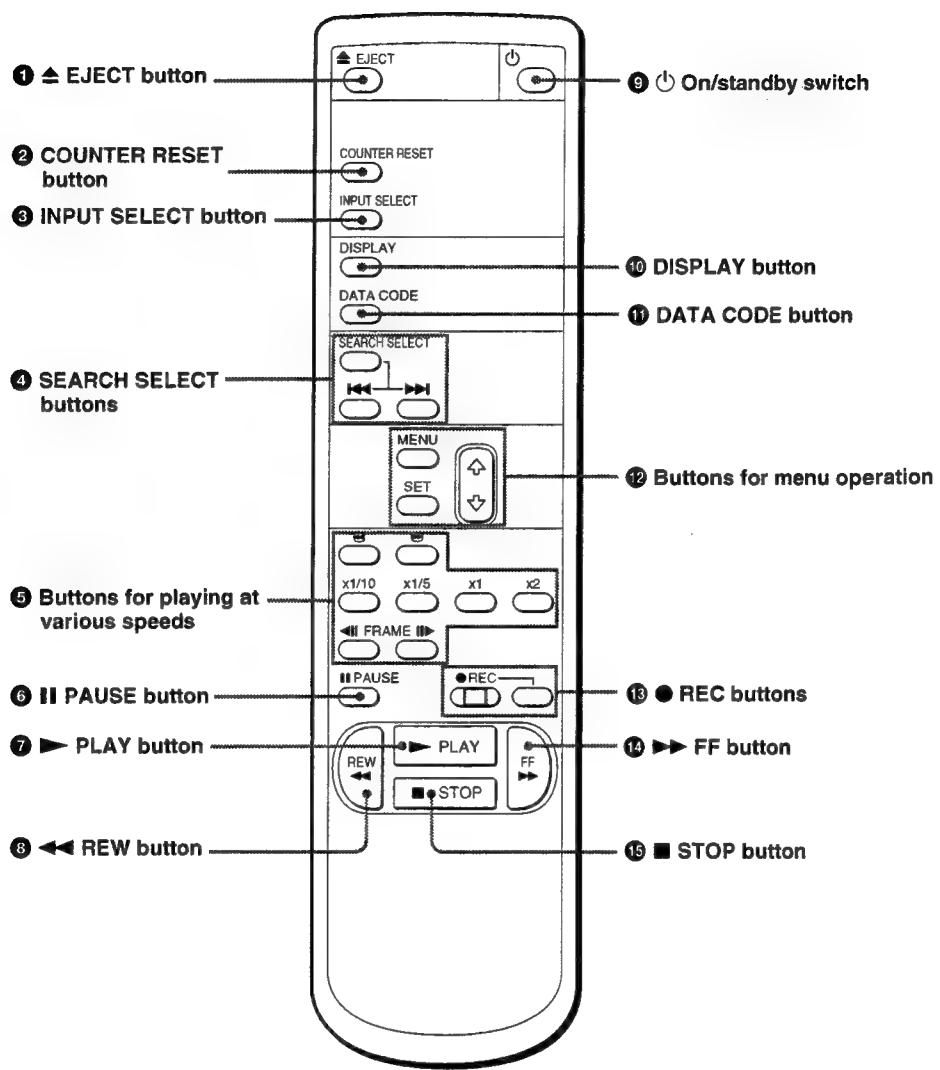
12 Equipotential ground terminal 

Used to connect to the equipotential plug to bring the various parts of a system to the same potential.

Refer to "Important safeguards/notices for use in the medical environment" on page ii.

Location and Function of Parts

Supplied Remote Commander



1 ▲ EJECT button

2 COUNTER RESET button

3 INPUT SELECT button

4 SEARCH SELECT buttons

Press these buttons to search for scenes using the index function.

For details, see "Searching using the index function" on page 19.

5 Buttons for playing at various speeds

◀/▶ buttons

× 1/10 button

× 1/5 button

× 1 button

× 2 button

FRAME ◀/II/II▶ buttons

For details, see "Playing at various speeds" on page 18.

6 **PAUSE** button**7** **PLAY** button**8** **REW** button**9** **On/standby** switch**10** **DISPLAY** button

Press this button to see the indications, such as tape counter, on the monitor screen.

11 **DATA CODE** button

Press this button to see tape information on the monitor screen.

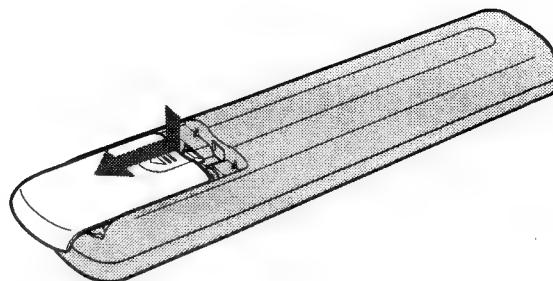
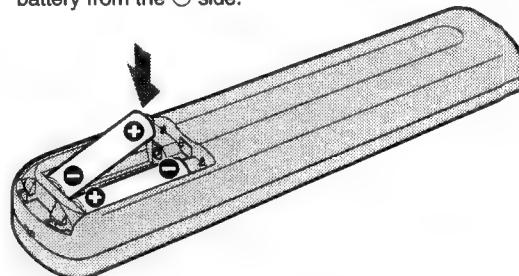
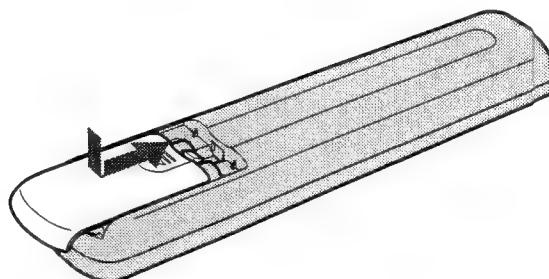
For details, see "Displaying tape information" on page 22.

12 **Buttons for menu operation****MENU** button**SET** button**↑/↓** buttons**13** **REC** buttons

When you press these buttons at the same time, the indicator lights and recording begins.

14 **FF** button**15** **STOP** button**Note**

When using the supplied remote commander, set REMOTE CONTROL in the menu to VTR4 (see page 34). Otherwise, you cannot operate this VCR with the supplied remote commander.

Battery installation**1** Push and slide the lid to open.**2** Install the two size AA (R6) batteries (supplied) with the correct polarity.Be sure to install the battery from the \ominus side.**3** Replace the lid.**Notes on batteries**

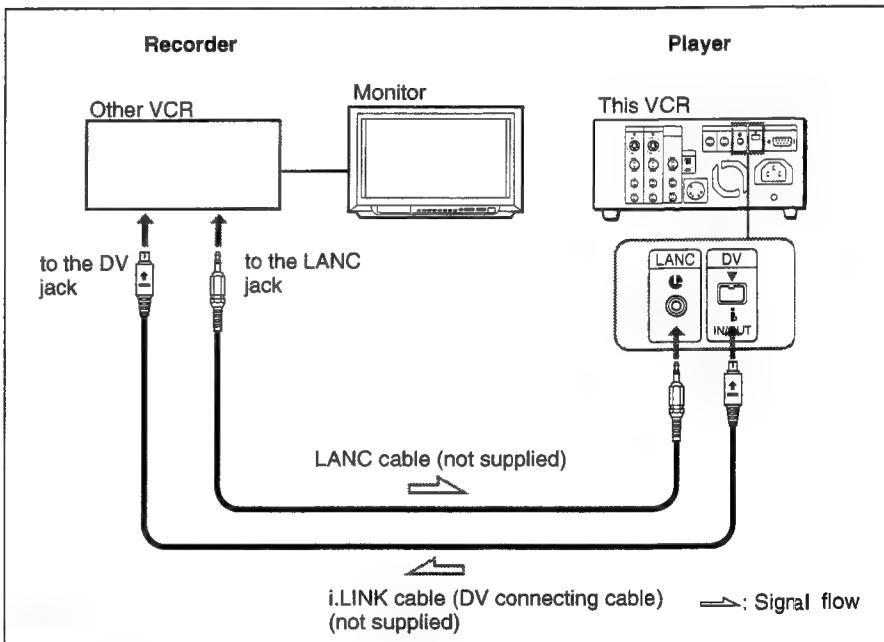
- Make sure that the battery orientation is correct when inserting batteries.
- Do not mix an old battery with a new one, or different types of batteries.
- If you will not use the Remote Commander for a long time, remove the batteries to avoid damage from battery leakage. If batteries have leaked, remove them, wipe the battery compartment dry and replace the batteries with new ones.

This section describes the necessary connections, settings and operations to perform playback on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing, or as a stand-alone videocassette player.

Connections for Playback

To digital video equipment with DV jack

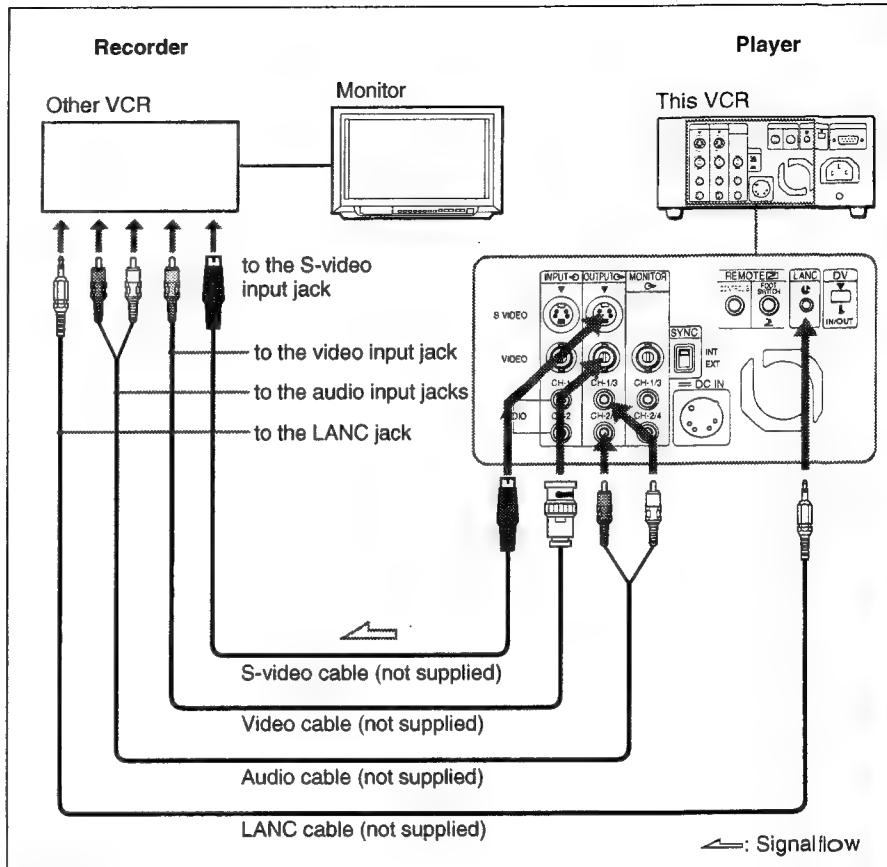
The video and audio signals are sent with hardly any degradation, enabling high-quality editing. The signal flow is automatically detected so you need not make separate connections for input and output.



Notes

- Set DV EE OUT in the menu to OFF (see page 34).
- Audio signals are not output during playing at various speeds.
- With the DV connection, the sound is recorded in the same audio recording mode as that of the source tape. To record in a different audio recording mode from the source tape, use the INPUT \Rightarrow connectors instead.
- With the DV connection, tape information (recording date, camcorder data, etc.) recorded on the source tape is transmitted from this VCR (player). As a result, when you play back a recorded tape and press the DATA CODE button, the same tape information recorded on the source tape is displayed on the monitor screen. However, contents of the cassette memory are not transmitted. In addition, the time code is newly recorded on the tape on the other VCR, except when copying a tape in Duplicate mode.
- As for the LANC connection, see "Notes for LANC connection" on the next page.

To video equipment without DV jack



Notes

- When you connect output jacks of the recorder to input jacks of this VCR, select the input correctly to prevent a humming noise.
- Distorted signals (e.g., when played back at a speed other than normal) will not be recorded properly.
- The indications displayed on the monitor screen are output only via the MONITOR OUT connector.

Notes for LANC connection

- With the LANC connection, refer to the instruction for use supplied with the recorder VCR.
- The LANC connection transmits signals such as control signals, time code, time counter data and status data.
- If the other VCR has a LANC jack of 5-pin DIN type, connect with the VK-810 Control L connecting cable (not supplied).
- The jacks labeled CONTROL L have the same function as LANC jacks. The jacks labeled REMOTE on other equipment may also have the same.
- The other VCR (recorder) receives the time code data from the LANC jack only when this VCR (player) is set to show the time code indications.
- With the LANC connection, this VCR only works as a slave unit.

Settings for Playback

Preparation on the player (this VCR)

- 1 Power on the video monitor, then set the monitor's input according to the input signals from the recorder.
- 2 Set up the recorder.
For details, see "Preparation on the recorder" below.
- 3 Power on this unit by pressing the  ON/STANDBY switch.
The ON/STANDBY lamp lights in green.
- 4 If the other equipment that controls this VCR has the time code function, set the COUNTER SELECT selector to TC (see page 9).
- 5 When you play back a tape recorded in 4-channel mode (Fs 32k), set the AUDIO MONITOR selector to MIX (see page 9). Then select the precise balance between the tracks with the AUDIO MIX BALANCE in the menu (see page 33).

Notes

- With the DV connection, the playback VCR's AUDIO MONITOR (sound selection) and AUDIO MIX BALANCE (audio balance adjustment) do not function on the source audio output through the DV  jack.
- You cannot change the input signal selection during playback or playback pause mode.

Preparation on the recorder

- Insert a tape for recording.
- Select the formats of video and audio input signal to be recorded.
- Set the LANC mode to M.

Notes

- Editing is not possible with a tape that is copyright protected.
- You cannot use the video equipment that has no LANC mode switch as a recorder.

Playback Procedure

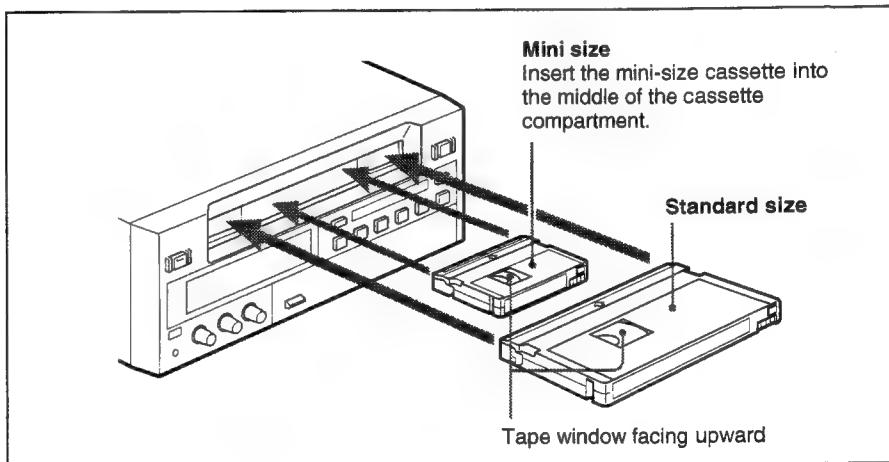
Notes

- When controlling this unit from an editing controller or a personal computer, set the REMOTE/LOCAL switch to REMOTE. When not, set the switch to LOCAL (See page 9).
- Do not insert the cassette forcibly. The VCR may be damaged.

- 1 After checking the tape for slack, hold the cassette so that the tape window is facing upward, then insert it into this unit as illustrated below.

For details of checking the tape for slack, see page 5.

The cassette is automatically drawn into the unit.



- 2 Press ► PLAY.

This starts the playback operation.

Playback Functions

Playing at various speeds

You can enjoy playback functions using supplied remote commander.

Playback options	Operation
Play at 1/10 of normal speed	Press $\times 1/10$ during playback
Play at 1/5 of normal speed	Press $\times 1/5$ during playback
Play at normal speed	Press $\times 1$ during playback
Play at twice the normal speed	Press $\times 2$ during playback
Play frame by frame	Press FRAME $\blacktriangleleft/\triangleright$ during pause.

To hear the sound during playing at various speeds

If you want to hear the sound during playing at various speeds, set JOG WITH SOUND in the menu to ON (see page 33).

Searching using the index function

Three kinds of search are available on this VCR:

- Searching for the beginnings of recordings: Index search
- Searching for a point on the tape where the recorded date changes: Date search
- Searching for scenes recorded in the photo mode with a digital camcorder: Photo search

Searching with the cassette memory

If the tape has a cassette memory, the recordings are listed in the chronologically in the order they were made. You can search using this chronological list.

If the tape does not have a cassette memory, you cannot search for scenes in the chronological order.

- 1 Press SEARCH SELECT to select the search type: INDEX, DATE or PHOTO SEARCH.

The chronological list appears on the monitor screen.

INDEX SEARCH			CH
1	2/28/99	1:00AM	LINE
2	3/ 7/99	12:59PM	LINE
3	3/11/99	3:05AM	LINE
4	5/ 5/99	7:00PM	LINE
5	7/ 3/99	10:15AM	LINE
6	10/28/99	12:20PM	LINE
7	11/23/99	8:30AM	LINE
8	12/20/99	12:30AM	LINE
↓			

When selecting INDEX SEARCH (DSR-20MD)

- 2 Press **◀◀** or **▶▶** to select a recording.

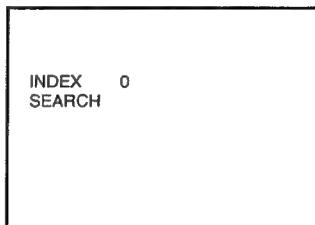
The VCR starts searching and when it locates the recording, begins playback. During Photo search, the VCR pauses.

Searching without cassette memory

When you use a tape without a cassette memory, the VCR searches in the order of the actual positions of the recordings, regardless of the setting of CASSETTE MEMORY SEARCH in the menu.

When you use a tape with a cassette memory, set CASSETTE MEMORY SEARCH in the menu to OFF (see page 34).

- 1 Press SEARCH SELECT to select the search type.



When selecting INDEX SEARCH

- 2 Press **◀◀** or **▶▶** repeatedly to locate the recording you want.

The VCR starts searching backwards or forwards until the index number comes to zero, then plays back the recording. During Photo search, the VCR pauses.

How signals are recorded

The VCR marks the tape when **REC** button is pressed.

There are three different signals for each search method. The type of signal recorded and where it is recorded (on the tape or in the cassette memory) depends on the video equipment used for recording. Please note that if the signals for certain search type are not recorded, you cannot do that type of search.

When you record with a Sony digital camcorder (DSR-200/200P/200A/200AP/PD100/PD100P/PD100A/PD100AP)

Signals for	In cassette memory	On tape
Index search*	No	No
Date search	Yes	Yes
Photo search	Yes	Yes

When you record on this VCR

Signals for	In cassette memory	On tape
Index search*	Yes	Yes
Date search	No	Yes
Photo search	No	No

* The signals for Index search are recorded when you start recording in stop mode.

Note

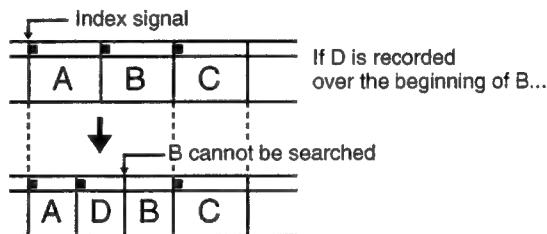
When recording on this VCR, signals for index search do not have information on a day of the week.

About the cassette memory

- If you use a tape with **CII** mark, the cassette memory stores up to 135 index signals. (The number changes depending on the data size combination of index, date, and photo data stored on a tape.) This VCR is capable of storing and retrieving up to 16 kbits of cassette memory.
- To locate recordings whose signals are disabled to be stored in the cassette memory, or to locate recordings in order of their position on the tape, set CASSETTE MEMORY SEARCH in the menu to OFF (see page 34). You can use the same procedure to search for a recording on a tape without cassette memory.

Notes

- Each program is indexed at its beginning. If you record another program over the beginning of the first program, you will not be able to locate the original program.

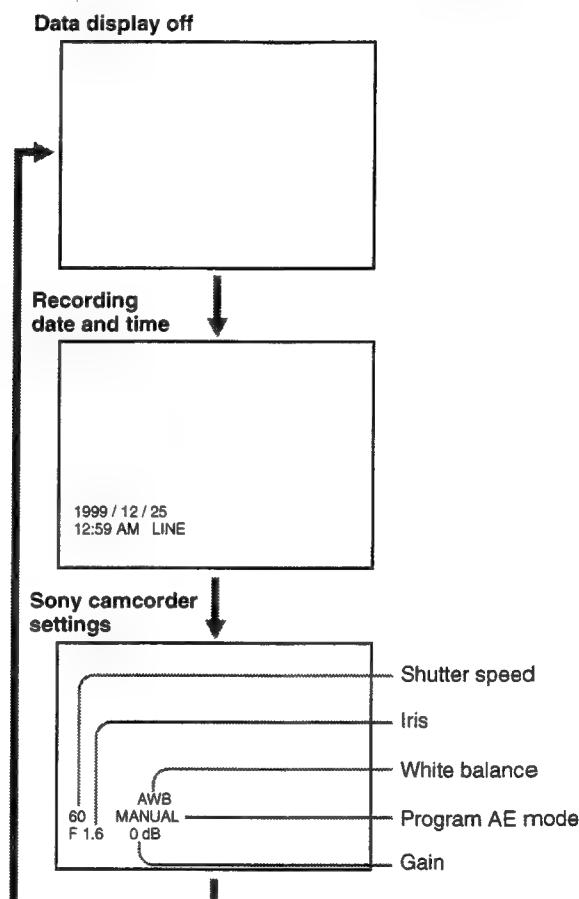


- You cannot add indexes after recording.
To add indexes only for Auto Repeat, start recording from the point you want to start indexing.
- You cannot erase indexes after recording.
To delete indexes for Auto Repeat, set INDEX WRITE in the menu to OFF (see page 34). Then record over the index signal you want to erase.
- Searching may not be done correctly if the signals were not recorded on a Sony-brand digital video equipment.

Displaying tape information

If you record on a tape using a Sony digital camcorder DSR-200/200P/200A/200AP/PD100/PD100P/PD100A/PD100AP, camcorder data (the shutter speed, program AE mode, white balance, iris and gain) can be recorded on the tape. You can check these data during playback on this VCR.

Press DATA CODE during playback.
Each time you press DATA CODE, the display changes as follows.



(Illustration: DSR-20MD)

Notes

- When the information was not recorded, “---” appears instead.
- The camcorder data displayed on the monitor screen by this VCR are partially different from those shown by the digital camcorder.

Auto Repeat

This VCR can repeat the playback of all or a part of the tape.

- 1 Set the TIMER selector on the front panel to REPEAT.

The TIMER indicator on the front panel lights.

- 2 Press **◀◀ REW** to rewind the tape to its beginning.

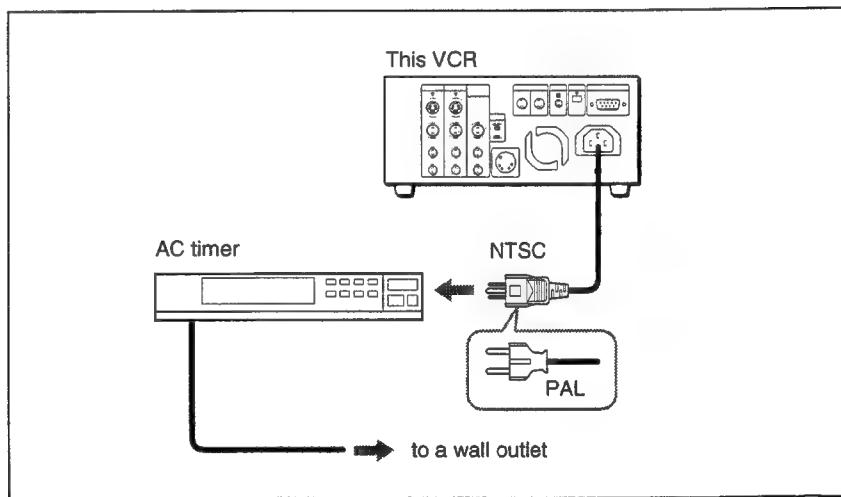
- 3 Press **▶ PLAY**.

Playback starts automatically. The VCR repeats the playback from the beginning to the first index (if there is no index on the tape, to the unrecorded portion; if no unrecorded portion, to the tape end).

Auto Repeat using an external AC timer

If you connect an external AC timer (not supplied) to this VCR, you can repeat playback automatically at the preset time.

- 1 Connect an external AC timer (not supplied) to this VCR.



- 2 Set the TIMER selector on the front panel to REPEAT.

The TIMER indicator in the display window lights.

- 3 Set the timer-on time on the external AC timer.

At the preset time, the power turns on, and Auto Repeat playback starts automatically within one minute. The VCR repeats the playback from the beginning to the first index (if there is no index on the tape, to the unrecorded portion; if no unrecorded portion, to the tape end).

Notes

- The VCR cannot search for an index or unrecorded portion within 20 seconds from the beginning of the tape.
- While a tape is running, do not turn off the power using an AC timer. The VCR and a tape may be damaged. When turning off the power of the VCR, make sure to press the ■ STOP button on this VCR first to stop the tape transport, then turn off the power.

To stop Auto Repeat

Press the ■ STOP button.

To release Auto Repeat mode

Set the TIMER selector to OFF.

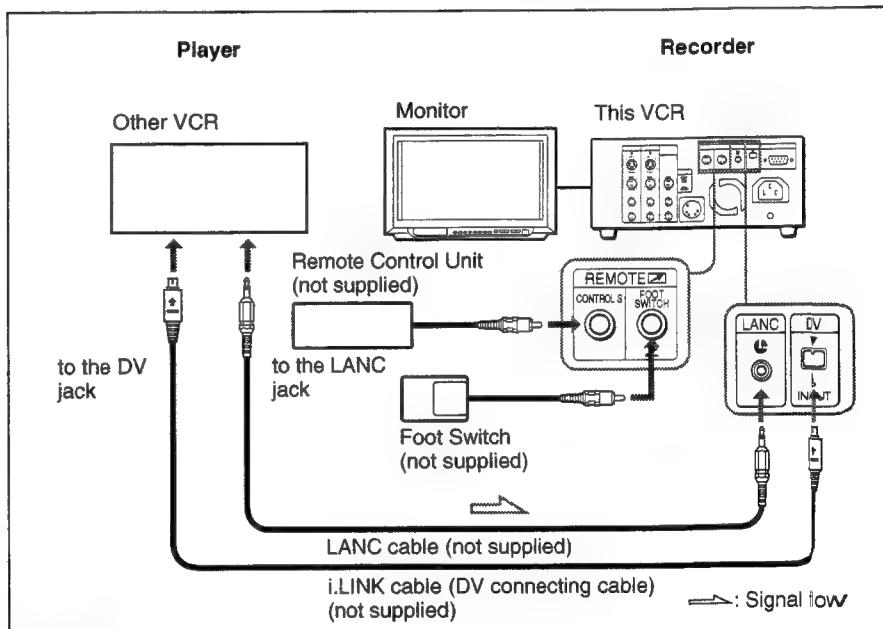
Recording

This section describes the necessary connections, settings and operations to perform recording on this unit. The same settings and operations apply whether you are using the unit as part of an editing system, for dubbing, or as a stand-alone recorder.

Connections for Recording

To digital video equipment with DV jack

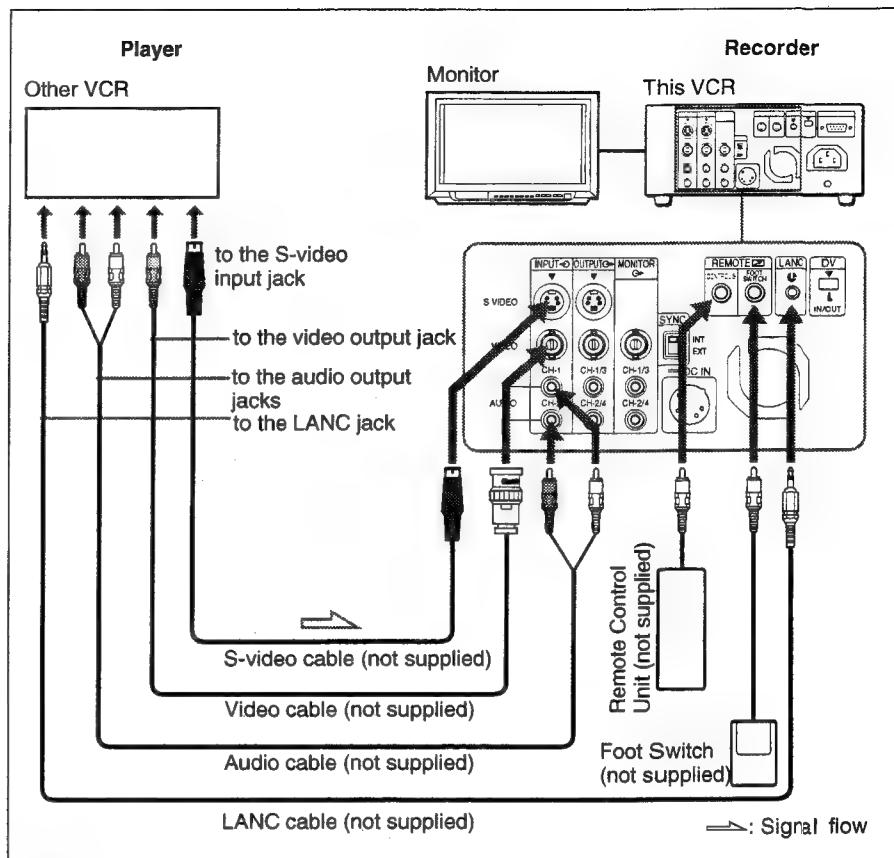
The video and audio signals are sent with hardly any degradation, enabling high-quality editing. The signal flow is automatically detected so you need not make separate connections for input and output.



Notes

- Audio signals are not output during playing at various speeds.
- With the DV connection, the sound is recorded in the same audio recording mode as that of the source tape. To record in a different audio recording mode from the source tape, use the INPUT \ominus connectors instead.
- With the DV connection, tape information (recording date, camcorder data, etc.) recorded on the source tape is transmitted from the other VCR (player). As a result, when you play back a recorded tape and press the DATA CODE button, the same tape information recorded on the source tape is displayed on the monitor screen. However, contents of the cassette memory are not transmitted. In addition, the time code is newly recorded on the tape on this VCR, except when copying a tape in Duplicate mode.
- As for the LANC connection, see "Notes for LANC connection" on the next page.

To video equipment without DV jack



Notes

- When recording the analog input signals, this VCR can digitally output the signals from the DV  jack for backup. Set DV EE OUT in the menu to ON (see page 34).
- When you connect output jacks of this VCR to input jacks of the player, select the input correctly to prevent a humming noise.
- Distorted signals (e.g., when played back at a speed other than normal) will not be recorded properly.
- The indications displayed on the monitor screen are output only via the MONITOR  connector.

Notes for LANC connection

- With the LANC connection, refer to the instruction for use supplied with the player VCR.
- The LANC connection transmits signals such as control signals, time code and time counter data and status data.
- If the other VCR has a LANC  jack of 5-pin DIN type, connect with the VK-810 Control L connecting cable (not supplied).
- The jacks labeled CONTROL L has the same function as LANC  jacks. The jacks labeled REMOTE on other equipment may also have the same.
- This VCR (recorder) receives the time code data from the LANC  jack only when the other VCR (player) is set to show the time code indications.
- With the LANC connection, this VCR only works as a slave unit.

Settings for Recording

Preparation on the recorder (this VCR)

Notes

- Before recording, set the clock on the VCR so that the recording time can be written into the index signal. You can set the clock by setting the CLOCK SET menu (*see page 34*).
- When controlling this unit from an editing controller or a personal computer connected to the RS-232C  connector, set the REMOTE/LOCAL switch to REMOTE. When not, set the switch to LOCAL (*See page 9*).
- Editing is not possible with a tape that is copyright protected.

- 1 Power on the video monitor, then set the monitor's input according to the input signals from this unit.
- 2 Set up the player to play back a tape.
For details, see "Preparation on the player" on the next page.
- 3 Power on this unit by pressing the  ON/STANDBY switch.
The ON/STANDBY lamp lights in green.
- 4 Use the COUNTER SELECT selector to select the type of time data to be used.

Type of time data	Set the selector to
Count value of the time counter	COUNTER
Time code	TC

- 5 Select the video and audio input signals to be recorded.

Press INPUT SELECT to select the desired signal. Each press of this button cycles through three video signal selection options: video, S-video, and DV input. Each selection is shown by a lit indicator in the display window.

Note

Once you have started recording, you cannot change the input signal selection (except during recording pause mode).

6 When using the line connections (INPUT - \ominus connectors), select the audio mode.

Select the desired mode by setting the AUDIO MODE menu.

Audio mode	Set the menu to
2-channel mode	Fs48k
4-channel mode	Fs32k

On how to use the menu, see Chapter 3 “Menu Settings.”

Notes

- In the DVCAM format, there are two audio recording modes, with either two channels at 48 kHz or four channels at 32 kHz. It is not possible to select other modes (for example with four channels at 48 kHz).
- When recording in 4-channel mode on this VCR, audio signals are recorded only in channels 1/2.
- Once you have started recording, you cannot change the audio mode selection.

7 Use the  AUDIO INPUT LEVEL control knobs to adjust audio input levels.

Watching the audio level meter (see page 7), adjust the level so that the meter does not indicate higher values than 0 dB when the audio signal is at its maximum.

When the level exceeds 0 dB, sound distortion occurs.

Note

With the DV connection, the recorder VCR's AUDIO MODE (sound selection) and □ AUDIO INPUT LEVEL (audio balance adjustment) do not function.

Preparation on the player

- Insert a source tape.
- If the player VCR has an EDIT switch, set it to ON.
- Turn off the on-screen display.
- Set the LANC mode to M.

Note

With the DV connection, the playback VCR's AUDIO MONITOR (sound selection) and AUDIO MIX BALANCE (audio balance adjustment) do not function on the source audio output through the DV **i** jack.

Recording Procedure

Note

When controlling this unit from an editing controller or a personal computer connected to the RS-232C connector, set the REMOTE/LOCAL switch to REMOTE. When not, set the switch to LOCAL (See page 9).

- 1 After checking that the cassette's safety switch is set to write enabled position and the tape for slack, hold the cassette so that the tape window is facing upward, then insert it into this unit.

For details of the cassette's safety switch, see page 4. For details of checking the tape for slack, see page 5.

The cassette is automatically drawn into the unit and the tape is wound round the head drum. The tape is stationary while the head drum rotates.

- 2 Press the playback button on the player.

This starts the player's playback operation.

- 3 Press and hold ● REC, and press ► PLAY.

This starts the recorder's recording operation.

To stop recording

Press the ■ STOP button.

To record using the optional Foot Switch

- 1 Press the pedal of the Foot Switch when the VCR is in stop mode.

The VCR starts recording.

- 2 Press the pedal again.

The recording stops and the VCR goes into recording pause mode.

To stop recording

Press the ■ STOP button on the VCR.

Notes

- You should set the REMOTE/LOCAL switch to REMOTE to prevent concurrent use of the foot switch and the front panel controls.
- The beginning of the recording (for about two seconds) cannot be made. If you immediately start recording, press the pedal twice to go into recording pause mode, then start recording.
- The Foot Switch must be conformed with Standard UL2601-1/EN60601-1.

- The recording pause mode will be automatically released after five minutes to protect the tape, and the VCR goes into stop mode.
- The foot switch operation works even if the VCR is in any operation mode. To prevent accidental erasure of a recording, you should slide in the safety switch on the cassette so that the red portion becomes visible before you insert the cassette into this VCR.

Duplicate

If you copy a source tape, using the DUP (duplicate) button on this VCR, you can copy the time code recorded on the source tape as they are. You can easily make a work tape having the same time codes as the source tape.

The duplicate function on this VCR works only when using a source tape recorded in DVCAM format and making DV connections.

- 1 Connect this VCR and the other (playback) VCR, using an i.LINK cable (DV connecting cable) (not supplied) and select DV with the INPUT SELECT selector on this VCR.
- 2 Locate the points where you want to start playback and recording.
- 3 Press ■ STOP on this VCR to stop the tape transport operation.
- 4 Press and hold DUP on this VCR, and press ► PLAY.

The DUP indicator flashes and this VCR enters into duplicate-standby mode.

Notes

- If the other (playback) VCR has already started playback, the DUP indicator lights and duplicate starts immediately.
- If the other (playback) VCR is in the playback pause mode, duplicate starts immediately and this VCR continues to record a still picture and a certain time code.

- 5 Press the play button on the other VCR to start playback.

The DUP indicator lights and duplicate starts.

To adjust the point where duplicate starts

In step 4 above, press and hold the DUP button instead of the ► PLAY button, and press the ■ PAUSE button. This VCR remains recording standby mode until you press the ■ PAUSE button again.

After the other VCR starts playback, press the ■ PAUSE button at the point where you want to start duplicate.

To stop duplicate

Press the ■ STOP button.

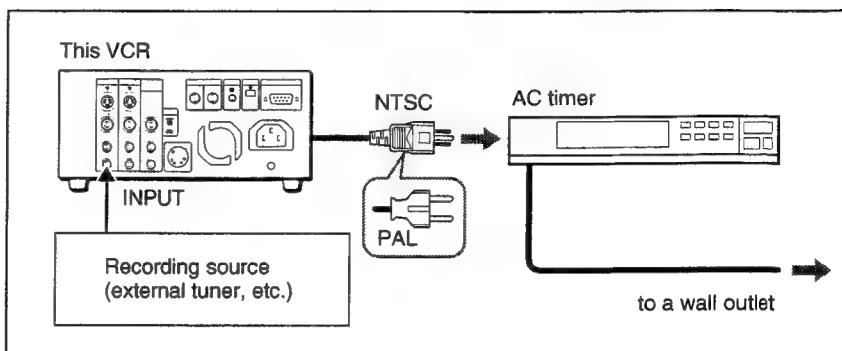
Notes

- During duplicate, do not change the speed of the player's tape or set it to pause mode. Otherwise, the time code of the recorded tape becomes out of sequence and you cannot use it for editing.
- During duplicate, time counter does not appear. Check it in the other VCR.
- When you start duplicating, the first part of the source tape may be dropped on the copied tape. Play back the source tape from the preceding point. You cannot completely copy the tape if the source tape is recorded from its beginning point.
- You may not be able to copy the first part or an unrecorded portion of the source tape. Locate the recorded portion on the source tape, then start copying.
- The recording does not stop the moment you press the ■ STOP button to stop editing. The source picture may be recorded a little longer than you expected.
- If you duplicate a tape by using two DSR-20MD/20MDPs, set DV EE OUT in the menu of the player to OFF (see page 34).
- The index signals are not recorded when the duplicate starts.
- If you set the REMOTE/LOCAL switch to REMOTE during duplicate, the tape stops.

AC timer recording

By connecting this VCR to an external AC timer (not supplied), you can start recording at a preset time.

- 1 Connect this VCR to an external AC timer (not supplied).



- 2 Insert a tape for recording.
- 3 Press INPUT SELECT to select the recording source.
- 4 Set the timer-on time on the connected AC timer.

At the preset time, the power of this VCR and the recording source turn on automatically and recording starts about several to 10 seconds later. Set the timer allowing a margin for the recording to start.

- 5 Set the TIMER selector at the front to REC.

You need not press ● REC.

If the tape ends before the recording source stops operation
The tape stops without rewinding.

If you set AUTO REWIND in the menu to ON, the tape rewinds to its beginning automatically (see page 34).

To stop recording during the timer recording
Press the ■ STOP button.

To release AC timer recording
Set the TIMER selector to OFF.

Note

While a tape is running, do not turn off the power using an AC timer. The VCR and a tape may be damaged. When turning off the power of the VCR, make sure to press the ■ STOP button on this VCR first to stop the tape, then turn off the power.

Changing Menu Settings

This VCR has various functions available, and you can set and check them on the monitor screen. **Before operation, set the clock by setting the CLOCK SET menu.**

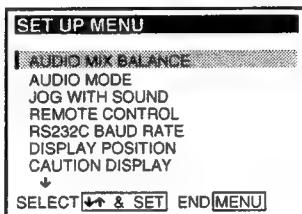
You can change the menu settings on the SET UP MENU screen. If necessary, change the settings manually during editing, etc.

Changing the SET UP MENU Settings

Follow the instructions below to change the settings.

1 Press MENU.

The SET UP MENU appears on the monitor screen. To cancel the menu settings, press MENU again.



2 Press \uparrow/\downarrow to select the option you want to change, and press SET.

Each menu option appears on the monitor screen (*see the table below*).

3 Press \uparrow/\downarrow to change the setting, and press SET.

The menu disappears from the monitor screen.

Menu Contents

Initial settings are indicated in bold letters.

Menu options	Set this option to	Description of settings
AUDIO MIX BALANCE		If you set the AUDIO MONITOR selector to MIX, you can select the precise balance between channels 1/2 and channels 3/4 by five steps.
AUDIO MODE	Fs48k	• To set the audio mode to 2-channel mode (16bit mode). This mode uses the whole audio area to record one stereo track. You can get higher sound quality.
	Fs32k	• To set the audio mode to 4-channel mode (12bit mode). This mode separates the audio area into two parts. You can record two kinds of audio, stereo 1 and stereo 2. When recording on this VCR, audio signals are recorded only in channels 1/2.
JOG WITH SOUND	ON OFF	• To listen to the sound when playing a tape in various speeds. • To turn off the sound when playing a tape in various speeds.

Menu Organization

Menu options	Set this option to	Description of settings
REMOTE CONTROL		Set the command mode (VTR1 to 6, INST) on this VCR. Change this setting when using infrared remote commander or external (remote) equipment to remotely control the unit. When using the supplied remote commander, select VTR4 (initial setting). When using the remote controller such as the optional DSRM-10 or SVRM-100A, select INST. When selecting OFF, you cannot remotely control the unit.
RS232C BAUD RATE	9600bps 19200bps	<ul style="list-style-type: none"> • To set the baud rate with an editing controller that supports RS-232C interface to 9600bps. • To set the baud rate to 19200bps.
DISPLAY POSITION	CENTER LOWER RIGHT	<ul style="list-style-type: none"> • To display the tape counter in the center of the monitor screen. • To display the tape counter in the lower right of the monitor screen.
CAUTION DISPLAY	ON OFF	<ul style="list-style-type: none"> • To display the alarm message on the monitor screen. • Not to display the alarm message.
BEEP	ON OFF	<ul style="list-style-type: none"> • To output a beep sound when an illogical operation is made. • To deactivate it.
INDEX WRITE	AUTO OFF	<ul style="list-style-type: none"> • To record index signals when recording begins. • Not to record index signals.
CASSETTE MEMORY SEARCH	AUTO OFF	<ul style="list-style-type: none"> • To search recordings with the cassette memory. If the tape does not have a cassette memory, the VCR will search recordings using index signals recorded on the tape itself. • To search recordings using the index signals recorded on the tape.
CASSETTE MEMORY ERASE	ALL DATA INDEX DATA DATE DATA PHOTO DATA	<ul style="list-style-type: none"> • To erase all the data in the cassette memory. • To erase index data in the cassette memory. • To erase date data in the cassette memory. • To erase photo data in the cassette memory. <p>Note When using the cassette whose memory can store over 16 Kbits of data, you can only select ALL DATA. You cannot erase index data on the tape.</p>
TIME CODE (DSR-20MD only)	AUTO NDF DF	<ul style="list-style-type: none"> • To set the time code to the same one as already recorded on the tape. • To set the time code to Non Drop Frame. • To set the time code to Drop Frame. <p>Note If you use AUTO and start recording at the beginning of the tape, the time code is set to Non Drop Frame.</p>
AUTO OFF	ON OFF	<ul style="list-style-type: none"> • To turn off the VCR automatically if there is no operation for an hour during stop mode (Auto Off). • To deactivate Auto Off.
AUTO REWIND	ON OFF	<ul style="list-style-type: none"> • To rewind the tape to its beginning automatically if the tape reaches to an end (Auto Rewind). • To deactivate Auto Rewind.
PHOTO PB	FIELD FRAME	<ul style="list-style-type: none"> • To prevent the picture from blurring when playing a tape recorded in photo mode. • To see clear picture when playing a still picture. <p>Note When using FRAME, the picture recorded in photo mode may blur.</p>
CLOCK SET		Set the clock on this VCR so that the recording time can be written into the index signal. Using \uparrow/\downarrow and SET buttons, set the date and time.
HOURS METER	DRUM ROTATION THREADING	<p>The digital hours meter keeps cumulative counts of the head drum rotation time and the number of unthreading operations. These counts can be displayed on the monitor screen and are unresettable.</p> <ul style="list-style-type: none"> • The cumulative total hours of drum rotation with tape threaded is displayed in 10-hour increments. • The cumulative number of tape unthreading operation is displayed in 10-operation increments.
DV EE OUT	ON OFF	<ul style="list-style-type: none"> • To output the selected line input signals from the DV \square jack. • To output only playback video and audio signals from the DV \square jack.

Alarm Messages

Various messages appear on the monitor screen ("Err" appears in the display window). Check them with the following list.

Message	Meaning / Remedy
PLEASE CONFIRM THE SAFETY SWITCH OF THE CASSETTE	Check that the protect tab is slid in so that the red portion visible. → Slide back the safety switch (see page 4).
NO CASSETTE MEMORY	You try to erase cassette memory when there is no cassette memory.
VCR IS RECORDING	You press a certain operation button during recording or editing.
PLEASE INSERT A NEW CASSETTE	Though no cassette is inserted in the cassette compartment, you press ► PLAY, etc. → Insert a cassette.
THE TAPE IS REWOUND	You press ◀ REW at the beginning of the tape.
PLEASE REWIND OR INSERT A NEW CASSETTE	You try to start playback or recording at the tape end. → Rewind the tape or insert a new cassette.
PLEASE SET THE CLOCK	When turning on the power, the clock has not been set. → Set the clock in the menu (see page 34).
THIS PROGRAM IS COPYRIGHT PROTECTED	You try to dub the tape on which copyright protect signals are recorded.
CASSETTE MEMORY IS TOO LARGE TO ERASE	You try to erase "INDEX DATA," "DATE DATA," or "PHOTO DATA" on a tape having more than 16 Kbits memory capacity. → Erase "ALL DATA" on the tape (see page 34).
WRITING ON CASSETTE MEMORY. PLEASE WAIT	You do certain operation while the VCR is writing on cassette memory. → Operate after writing on cassette memory is complete.
VCR IS IN DUP MODE	You press a certain operation button during duplicate.

Troubleshooting

If the VCR does not function or functions incorrectly, check the following.

Symptom	Cause / Remedy
The power cannot be turned on.	The power plug is disconnected. → Connect the plug.
The unit will not operate even if the power has been turned on.	<ul style="list-style-type: none">• The REMOTE/LOCAL switch is set to REMOTE. → Set it to LOCAL (See page 9).• Moisture condensation occurs. → Turn off the power and disconnect the power plug. After about one minute, connect the plug and turn on the power. → Wait for about one hour with the power turned on.• The cassette is not inserted straight. → Insert it straight.
The unit cannot be controlled using buttons on the unit.	The REMOTE/LOCAL switch is set to REMOTE. → Set it to LOCAL (See page 9).
The cassette cannot be ejected.	The REMOTE/LOCAL switch is set to REMOTE. → Set it to LOCAL (See page 9).
The cassette cannot be inserted, or it is ejected promptly.	<ul style="list-style-type: none">• There is moisture condensation on the head drum. → Wait for about an hour.• The cassette is not inserted straight. → Insert it straight.
No picture.	The video heads are dirty. → Clear the video heads using the cleaning cassette.
Noise appears on the screen.	<ul style="list-style-type: none">• A damaged cassette is inserted. → Insert other cassette.• The video heads are dirty. → Clear the video heads using cleaning cassette.
No picture via the DV jack.	Reconnect an i.LINK cable (DV connecting cable) (not supplied).
The audio is noisy.	A damaged cassette is inserted. → Insert other cassette.
The playback automatically starts when the power is turned on.	The TIMER selector is set to REPEAT. → Set it to OFF (See page 9).
The recording automatically starts when the power is turned on.	The TIMER selector is set to REC. → Set it to OFF (See page 9).
The remote commander does not function.	<p>The batteries are dead. → Replace the batteries. Something is blocking the infrared rays. → Remove the obstacle. The command mode is wrong. → Set up REMOTE CONTROL in the SET UP MENU (See page 34).</p>
The menu does not appear.	Connect the video monitor to the MONITOR G connector.

Notes on Use

Notes on the video cassette recorder

Do not install the unit in a place subject to direct sunlight or heat sources

If you do, its cabinet, mechanical parts, etc., may be damaged.

Do not install the unit in an extremely hot place

If the unit is left in a car parked with its windows closed (especially in summer), its cabinet may be damaged or it may not work correctly.

If the unit is brought directly from a cold to a warm location

Moisture may condense inside the unit and cause damage to the video head and tape. If you use the unit in a place subject to direct cold currents from an air conditioner, moisture may also condense inside the unit.

Do not place a heavy objects on the unit

The cabinet may be damaged, or the VCR may not work correctly.

Do not handle the recorder roughly

Avoid rough handling or mechanical shock.

To avoid damaging the cabinet finish

Plastic is often used for the surface finishing of the recorder. Do not spray a volatile solvent such as an insecticide toward the cabinet or place rubber or vinyl products on the cabinet for a long time. If you do, the finish of the cabinet may be damaged or the coating may come off.

Do not clean the cabinet with thinner or benzine

The cabinet may be damaged or its coating may come off. When you use a chemical-impregnated cloth, use it according to its directions.

Clean the cabinet with soft dry cloth

When the cabinet is very dirty, clean it with a soft dry cloth lightly moistened with a mild detergent solution and finish it with dry cloth.

Do not put magnetic objects close to the unit

Magnetic fields may damage the recording.

Checking the video heads every 1000 hours

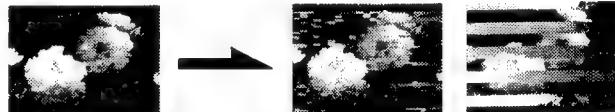
A VCR is a high-precision piece of equipment that records and plays back the picture on a magnetic tape. In particular, the video head and other mechanical parts become dirty or worn. To maintain a clean picture, we recommend maintenance every 1000 hours, though the using condition may differ depending on temperature, humidity, dust, etc.

Cleaning of the video heads

If the video heads are contaminated, the pictures cannot be recorded properly or the playback pictures become noisy. If the following phenomena occur, use the cleaning cassette PDVM-12CL (supplied) or PDV-12CL (not supplied) to clean the heads.

- Square-shaped noise appears on the playback picture.
- A part of the playback picture does not move.
- The playback picture does not appear on the screen.

Symptoms caused by contaminated video heads



Normal picture

If these pictures appear on the screen, use the cleaning cassette.

To use the cleaning cassette

Refer to your cleaning cassette's operating instructions.

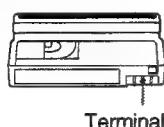
After prolonged use, the video heads may become worn out. If optimum picture quality is not restored even after you have cleaned the video heads with the cleaning cassette, the video heads may have worn out. In that case, you have to replace the video heads with new ones. Please consult your Sony dealer.

Notes on the video cassettes

Cleaning the terminal

If the terminal of the Standard-DVCAM or Mini-DVCAM cassette gets dirty, or dust sticks to the terminal, the VCR may not work correctly.

Clean the terminal with the swab once every ten times you eject a cassette.



When affixing a label on the cassette

Be sure to affix a label on only the correct location so as not to cause malfunction of the VCR.

After using a cassette

After use, please be sure to rewind the tape completely (to prevent picture and sound distortion). Return it to its case and store in upright position.

About moisture condensation

If the unit or tape is brought directly from a cold to a warm location, moisture may condense inside or outside the unit or tape. If you use the tape or video heads in this condition, the tape may adhere to the head drum, and the video heads or the tape may be damaged, or malfunction may occur.

Moisture condensation is likely to occur under the following conditions:

- The unit is brought from the cold outdoors to a warm indoor location.
- The unit is brought from the air-conditioned indoors to the hot outdoors.
- The unit is used in a place subject to cold currents from an air conditioner.

When bringing the unit from a cold place to a warm place or vice versa, put it in a plastic bag and seal the bag tightly. After bringing it into the new place, leave the bag on for about an hour, and remove the bag when the air temperature inside it has reached the temperature surrounding it.

If moisture condensation occurred

You cannot operate the unit except to press **▲ EJECT**. If you insert a cassette, it is ejected automatically. If this occurs, turn on the power, wait about an hour for the moisture to evaporate.

Digital hours meter

The digital hours meter keeps cumulative counts of the head drum rotation time and the number of unthreading operations. These counts can be displayed on the monitor screen. Use them as guidelines for scheduling maintenance.

In general, consult your Sony dealer about necessary periodic maintenance checks.

The digital hours meter has the following two display modes and you can check them in the HOURS METER menu (*see page 34*).

• DRUM ROTATION mode

The cumulative total hours of drum rotation with tape threaded is displayed in 10-hour increments.

• THREADING mode

The cumulative number of tape unthreading operation is displayed in 10-operation increments.

Self-diagnosis function

The unit is equipped with the self-diagnosis function that works to prevent the VCR from malfunctioning. A two-digit service number appears in the display window. In this case, check the following table.

Message	Symptom	Remedy
22	The video heads are dirty.	Clear the heads. (See page 38)
32	To prevent the unit from malfunctioning, the self-diagnosis function has worked.	<ul style="list-style-type: none">• Disconnect the power cord. After reinstalling the power source, operate the unit.• Remove the cassette or turn on/off the unit.
21	Moisture condensation has occurred.	Remove the cassette and leave the unit for at least one hour.

If you are unable to resolve the problem, contact your Sony dealer or local authorized Sony service facility and inform them of the number.

Specifications

System

Recording format	DVCAM format
Video signal	
DSR-20MD:	EIA STANDARD, NTSC color system
DSR-20MDP:	CCIR STANDARD, PAL colour system
Usable cassettes	Standard-DVCAM cassettes and Mini-DVCAM cassettes
Recording time	184 minutes (when using the PDV-184ME cassette) 40 minutes (when using the PDVM-40ME cassette)

Clock

Quartz locked	
DSR-20MD:	12-hour cycle display
DSR-20MDP:	24-hour cycle display
Power back-up	Built-in self-charging capacitor Back-up duration: up to about 100 hours (After 8-hour charges)

Inputs and outputs

Video input	BNC connector Input signal: 1 Vp-p (75 ohms unbalanced)
Video output	BNC connector Output signal: 1 Vp-p (75 ohms unbalanced)
S video input	Mini DIN 4-pin Luminance signal: 1 Vp-p (75 ohms unbalanced) Chrominance signal: 0.286 Vp-p (DSR-20MD) 0.3 Vp-p (DSR-20MDP) (75 ohms unbalanced)
S video output	Mini DIN 4-pin Luminance signal: 1 Vp-p (75 ohms unbalanced) Chrominance signal: 0.286 Vp-p (DSR-20MD) 0.3 Vp-p (DSR-20MDP) (75 ohms unbalanced)
Audio input	Phono jack (L, R) Input level: 2 Vrms (full bit) Input impedance: more than 47 kohms

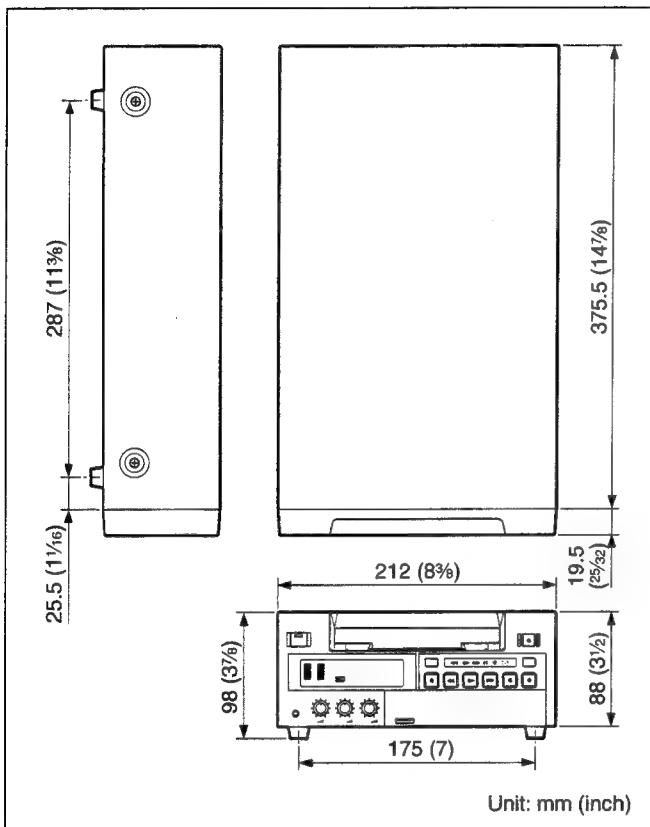
Audio output	Phono jack (L, R) Output level: 2 Vrms (full bit) Output impedance: less than 10 kohms
Monitor output	BNC connector Output signal: 1 Vp-p (75 ohms unbalanced)
Control S input	Stereo minijack (1) For the optional DSRM-10 Remote Control Unit
Foot switch input	Stereo minijack (1) For the optional Foot Switch
LANC input/output	Stereo mini-mini jack (1) For the optional RM-95 Remote Commander
RS-232C input/output	D-sub 9-pin connector (1) Output: 3 kilohms at load Typ ±9V Input: 5 kilohms at load High level 5 to 15V Low level -5 to -15V

Headphones output	Stereo minijack (1)
DV input/output	4-pin jack (1)

General

Power requirements	DSR-20MD: 120 V AC, 60 Hz 12 V DC, 2.0 A (4.0 A at the peak)
DSR-20MDP:	220 – 240 V AC, 50 Hz 12 V DC, 2.0 A (4.0 A at the peak)
Power consumption	DSR-20MD: 0.45 A at 77°F, 120 V AC, 60 Hz (during playback)
DSR-20MDP:	0.35 A at 25°C, 220 – 240 V AC, 50 Hz (during playback)
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage and transport temperature	-20°C to +60°C (-4°F to +140°F)
Operating humidity	20% to 80%
Storage and transport humidity	20% to 80%

Dimensions Approx. $212 \times 98 \times 395$ mm
 (8 $\frac{3}{8} \times 3 \frac{7}{8} \times 15 \frac{5}{8}$ inches)
 (w/h/d, including projecting parts
 and controls)



Mass Approx. 5 kg (11 lb.)

Supplied accessories

- Remote commander (1)
- Size AA (R6) batteries (2)
- AC power cord (1)
- Cleaning cassette (1)
- Instructions for Use (1)

Medical Specifications

Protection against electric shock:

Class I

Protection against harmful ingress of water:

Ordinary

Degree of safety in the presence of flammable
 anesthetics or oxygen:

Not suitable for use in the presence
 of flammable anesthetics or oxygen

Mode of operation:

Continuous

Design and specifications are subject to change
 without notice.

Compatibility of DVCAM and DV Format

DVCAM format is developed as a more reliable and higher end format than consumer DV format. Here are explained about DVCAM and DV formats: the differences, compatibility, and limitations on editing.

Differences between DVCAM and DV format

Item	DVCAM	DV
Track pitch	15μm	10μm
Audio sampling frequency	12bit: 32kHz 16bit: 48kHz	12bit: 32kHz 16bit: 32kHz, 44.1kHz, 48kHz
Audio recording mode ¹⁾	Lock mode	Unlock mode
Time code	Drop frame system or Non-drop frame system (DSR-20MD)	Drop frame system only (NTSC)

1) There are two modes for audio recording, Lock mode and Unlock mode. In Lock mode, the sampling frequencies of audio and video are synchronized. In Unlock mode, which consumer DV format adopts, the two sampling frequencies are independent. Therefore, lock mode is more effective than unlock mode in digital processing and smooth transition during audio editing.

DVCAM and DV cassettes

Both DVCAM and DV cassettes can be used on DVCAM or DV video equipment. The recording format of picture is defined according to recorder's format as described below.

Recorder's format	Cassette's format	Recording format
DVCAM	DVCAM DV	DVCAM
DV	DVCAM DV	DV

- This digital videocassette recorder complies with DVCAM format. Though DV cassettes can be used for recording, we recommend you to use DVCAM cassettes to get the most out of high reliability of DVCAM format.
- The recording time of DV cassettes is 2/3 shorter than that indicated on the DV cassettes.

Compatibility on playback

Some tapes cannot be played back on DVCAM or DV video equipment.

Tape	On DV video equipment	On DVCAM video equipment
DV-formatted	Can be played back	Can be played back (only when recorded in SP mode)
DVCAM-formatted	Some DV video equipment may be able to play back a DVCAM-formatted tape.	Can be played back

Compatibility on editing using DV connection

When this digital video cassette recorder is connected to other DVCAM or DV video equipment using DV connectors, the recording format of edited tapes is defined according to recorder's format as described below.

Source tape	Player's format	Recorder's format	Recorded format
DV-formatted ¹⁾	DVCAM	DVCAM DV	DVCAM ²⁾ DV
DV-formatted	DV	DVCAM DV	DVCAM ²⁾ DV
DVCAM-formatted ³⁾	DVCAM	DVCAM DV	DVCAM DV ⁴⁾
DVCAM-formatted ³⁾	DV ⁵⁾	DVCAM DV	DVCAM ⁶⁾ DV ⁴⁾

- 1) DV-formatted tapes recorded in SP mode only can be used as source tapes.
- 2) When you copy a DV-formatted tape using DVCAM video equipment, the recorded format of the copied tape is the following DVCAM format.
 - Audio recording mode of the copied tape is unlock mode.
 - Time code of the copied tape is partly inaccurate.
- 3) If you use the DVCAM-formatted tape as described in 2) above, audio recording mode of the recorded tape is unlock mode and time code is partly inaccurate.
- 4) Audio recording mode of the edited tape is lock mode.
- 5) Some DV video equipment may be able to play back a DVCAM-formatted tape. Even if the tape is played back, contents of the playback cannot be guaranteed.
- 6) Depending on signal conditions of the source tape, you may not be able to edit the tape using DV connection.

Limitations on editing

You will find the following limitations when editing.

- Due to the difference of a track pitch, you cannot record or edit on DV-formatted tapes using DVCAM video equipment.
- Depending on signal conditions, you may not be able to record or edit on DVCAM-formatted tapes. In these cases, copy the tape again using audio/video jacks.

Glossary

Audio recording mode

In the DVCAM format, the sound is recorded in either 16bit (Fs48k) or 12bit (Fs32k) mode.

Condensation

Condensation of moisture on the tape transport mechanisms of VCRs including the head drum. If moisture condenses on the head drum, the tape adheres to the drum and causes malfunction.

Drop frame mode

In NTSC format, the actual number of frames per second is approximately 29.97, while that for SMPTE time code is specified as 30. Drop frame mode is a mode in which time code is advanced in such a way that the difference in frame value between real time and time code is corrected. In this mode, two frames are skipped at the beginning of each minute, except for every tenth minute, so that the frame value for time code matches that for real time. *See also* "Non-drop frame mode."

EE mode

EE is an abbreviation of "Electric to Electric". Video and audio signals are supplied to the VCR's internal circuits, but not to the recording heads.

Loading

When being loaded, the tape is pulled out of the cassette case and threaded along the specified tape path and wrapped round the drum to be ready for recording or playback. Generally, this is done automatically when you place the cassette at the cassette entrance of the VCR. Also called threading.

Non-drop frame mode

A mode of advancing time code in such a way that the difference in frame value between real time and time code is neglected. Using this mode produces a difference of approximately 86 seconds per day between real time and time code, which may cause problems when editing programs in units of seconds using the number of frames as a reference.

Reference video signal

A video signal consisting of a sync signal or sync and burst signals, used as a reference.

Superimpose

To put a set of characters onto a picture so that both can be seen at the same time.

Sync signal

A reference signal consisting of vertical and horizontal sync signals used for synchronizing the scanning patterns of the video camera and the monitor.

Threading

See "Loading."

Time code

Signals recorded on the tape to supply information on tape position such as the hour, minute, second and frame, to assist in setting edit points or searching for particular scenes. This VCR can cope with both DF (Drop Frame) and NDF (Non Drop Frame).

On this VCR, the time code is recorded sequentially from "00:00:00:00," from the beginning of the tape. However, if there is a blank section on the tape, time code is reset and recorded from "00:00:00:00" again from the section just after the blank section. If the time codes are out of sequence, you may not be able to execute correct editing.

Unloading

When being unloaded, the tape is put into the cassette case from the tape path of the VCR. Generally, this is done automatically when you press the EJECT button. Also called unthreading.

Unthreading

See "Unloading."

12bit (Fs32k) mode

In the DVCAM format, the 12bit (Fs32k) mode separates the audio area into 2 parts. You can record two kinds of audio, stereo 1 and stereo 2.

16bit (Fs48k) mode

In the DVCAM format, the 16bit (Fs48k) mode uses the whole audio area to record one stereo track. You can get higher sound quality.

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